

REMARKS

The Examiner's action mailed on December 8, 2003 has been received and its contents carefully considered.

Claims 1-9 are pending in the application. Claims 2 and 5-7 are amended herein. Claim 1 and 6 remain the only independent claims.

In this Amendment, the second full paragraph on page 5 of the specification (lines 14-20) is amended to correct an obvious inconsistency in the description of the alternative embodiment of the invention, the one in which a second inner sleeve is fitted within the first inner sleeve. The second inner sleeve is described in the original text as being formed of either a brass or ceramic material, and as having a coefficient of thermal expansion greater than the first inner sleeve. This latter limitation does not properly apply to the ceramic material, which inherently has a thermal expansion coefficient that is less than the Invar alloy preferably used for the first inner sleeve. The Applicants propose to correct this misstatement by amending the paragraph to delete the reference to "a brass ... material" and to recite that the second inner sleeve has a coefficient of thermal expansion less than the first inner sleeve, consistent with a "ceramic material". Other changes to the text of the paragraph are made to correct minor informalities in grammar and usage.

The amendment to the specification does not introduce any new matter, as the use of a ceramic material for the second inner sleeve was disclosed in the original specification and claims. Accordingly, the Examiner's approval and entry of the amendment to the specification is respectfully requested.

The Applicants acknowledge with appreciation the Examiner's early indication that claims 1-5 are allowed. Claims 2 and 5 are amended herein in a manner consistent with the changes in the specification, which it is respectfully submitted does not affect their allowability.

The applicants also acknowledge with appreciation the Examiner's indication that claim 7 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims, and by overcoming the §112 rejection discussed below.

In the Action, claims 6-9 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement, meaning that the claims contained subject matter which was not describe in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the Examiner asserts that claim 6, lines 6-8, which requires that "the outer and first inner sleeves are secured together in a room temperature for compressing the first inner sleeve to extend axially by the outer sleeve," (emphasis added) appears inconsistent with the specification on page 4, lines 17-26, which discloses that the outer sleeve is secured to the inner sleeve by heating the outer sleeve to expand its inner diameter in order to slip it over the inner sleeve and then decreasing the temperature to cause contraction of the outer sleeve (i.e., a shrink fit process). Consistent with the Examiner's suggestion, the quoted language in claim 6 years is amended herein to read "the outer and the first inner sleeves are secured together at an elevated temperature and cooled to room temperature for compressing the first inner sleeve to extend axially by the outer sleeve." The Examiner is respectfully requested to approve the amended language of claim 6 and withdraw the §112, first paragraph, rejection of claims 6-9.

Claim 6 stands rejected under 35 U.S.C. §102(b) as being anticipated by Brown (U.S. Patent No. 4,717,977). Claims 8 and 9 stand rejected under 35 U.S.C. §103(a) as being obvious over Brown in view of Heldt (U.S. Patent No. 3,651,829). The rejections are respectfully traversed.

Regarding claim 6, the Examiner asserts that Brown, with reference to Figure 3, discloses an apparatus for automatically dynamically adjusting prestressed bearings of a shaft (44), comprising a sleeve assembly (34, 48) sandwiched between the bearings (66, 68) and including an outer sleeve (48) and a first inner sleeve (34) fitted together, wherein a first thermal expansion coefficient of the outer sleeve is larger less than the first inner sleeve (column 2, lines 64-69, discussing the differences of thermal expansion of the members 34, 48), an inner diameter of the outer sleeve is smaller than an outer diameter of the inner sleeve (column 4, lines 59-60, discussing interference fit between the members 34, 48), and the outer and first inner sleeves are secured together at an

elevated temperature and cooled for compressing the first inner sleeve to extend axially by the outer sleeve (column 4, lines 55-68, discussing a thermal heat shrink fit).

It is well established that each word in a claim must be given its proper meaning, as construed by a person skilled in the art. Where required to determine the scope of recited term, the disclosure may be used. See In re Barr, 44 F. 2nd 588, 170 USPQ 330 (CCPA 1971). Claim 6 recites that the apparatus comprises “a sleeve assembly sandwiched between the bearings and including an outer sleeve and first inner sleeve fitted together.” While the Brown reference arguably shows a sleeve assembly including an outer sleeve (48) and inner sleeve (34), it is respectfully submitted that the assembly in Brown is not disclosed as being “sandwiched between” the bearings, as that term is commonly understood and used in the present application. In the present application, Figure 2 clearly shows that the sleeve assembly 21, comprised of outer sleeve 22 and inner sleeve 23, are literally “sandwiched between” the bearings 11, 12 so as to press on them. By contrast, Brown plainly discloses the inner sleeve (34) and outer sleeve (48) as being outside the bearing races, rather than between them, so as to isolate the bearings from the outer sleeve.

In the Office Action, the text at column 5, lines 32-38 of Brown is cited by the Examiner for the proposition that Brown discloses an apparatus for automatically dynamically adjusting prestressed bearings. To the contrary, what the referenced text discloses is that “bearings 66 and 68 are normally designed to operate with a certain level of preloading, and the isolation of the bearings from the differential forces which could otherwise arise from the large thermal coefficient of expansion of aluminum, is a collateral advantage of the present invention” (emphasis added). In other words, Brown teaches directly away from a principal feature of the claimed invention, i.e., using an outer sleeve with a high coefficient of expansion to cause axial extension in an inner sleeve with a low coefficient of expansion. Given the objective in Brown, which is to prevent any significant change in bearing prestress, Brown does not describe or suggest at all this feature of the present invention.

For at least the foregoing reasons, it is respectfully submitted that the claimed invention and the apparatus of Brown differ significantly in configuration and purpose,

and, therefore, that claim 6, as well as claims 7-9, patently distinguishes over the applied reference.

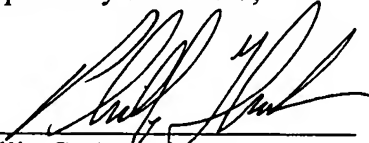
The Heldt reference is cited by the Examiner in connection with claims 8 and 9 for the general proposition that the outer sleeve may be brass and the inner sleeve may be an Invar alloy (see Heldt column 2, lines 27-31). Heldt, however, fails to otherwise cure the deficiencies of the Brown reference, discussed above.

As the Examiner points out in the Office Action, Heldt discloses a sleeve assembly (12-14), mounted on a shaft that is then sandwiched between the bearings (6) as shown in Figure 4. The sleeve assembly relies on the wedge shape of the sleeves to compensate for thermal expansion, wherein the outer wedges (12, 13) have a greater coefficient of thermal expansion than the inner wedge member (14). See column 2, lines 34-46. However, Heldt totally fails to disclose that "the outer and first inner sleeves are secured together at an elevated temperature and cooled to room temperature for compressing the first inner sleeve to extend axially by the outer sleeve," as recited in claim 6. It is clear that the principle of operation by which Heldt adjusts bearing prestress to compensate for temperature variations is completely different than that claimed in the present application.

In summary, it is submitted that this application, as amended, is in condition for allowance. Such action, and the passing of this case to issue are respectfully requested.

Should the Examiner feel that a conference would help to expedite the prosecution of this application, the Examiner is hereby invited to contact the undersigned counsel to arrange for such an interview.

Respectfully submitted,



Phillip G. Avuch
(Registration No. 46,076)
Rabin & Berdo, PC
Customer No. 23995
(202) 371-8976 (telephone)
(202) 408-0924 (facsimile)
firm@rabinchamp.com (e-mail)

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Date

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